CLAIMS

What is claimed is:

1. A teat cup assembly, comprising:

a tubular sleeve having an inner surface and an outer surface defining a sleeve bore between first and second open sleeve ends, the outer surface of the tubular sleeve defining an upper end portion and a lower end portion thereof;

a milk receiving cup having a portion configured to be operatively coupled to the lower end portion of the tubular sleeve; and

a liner member including:

a head portion including an upper teat chamber defined with a cylindrical wall having an outer exposed surface, an intermediate wall extending substantially orthogonally inward from the cylindrical wall and an upper seal wall laterally extending inward from the cylindrical wall having a central opening defined by the upper seal wall, the cylindrical wall of the head portion including a cylindrical retaining extension configured to cooperate with and be coupled to the upper end portion of the tubular sleeve; and

a tubular elongate inflation portion including side walls with opposite first and second ends defining a liner bore longitudinally along a length of the tubular elongate inflation portion with opposite first and second open ends, the first end integrally interconnected and extending from the intermediate wall of the head portion with the first open end opening into the upper teat chamber, the second end of the tubular elongate inflation portion being a free end;

wherein the tubular elongate inflation portion is configured to be inserted through the sleeve bore so that the cylindrical retaining extension is disposed around the upper end portion of the tubular sleeve with the inflation portion configured to be placed in tension with the free end of the tubular elongate inflation portion invertedly drawn around the lower end portion of the tubular sleeve with the portion of the milk receiving cup capturing the inverted free end between the lower end portion with an interference fit.

2. The teat cup assembly of claim 1, wherein the side walls of the tubular elongate inflation portion comprise at least three walls extending along the length of the inflation portion.

3. The teat cup assembly of claim 2, wherein the at least three walls include radial portions defined along the length of the inflation portion, the curved portions configured to interconnect adjacent side walls of the at least three walls.

4. The teat cup assembly of claim 3, wherein the side walls and the radial portions define a first thickness and a second thickness, respectively, the second thickness being larger than the first thickness.

5. The teat cup assembly of claim 1, wherein the tubular elongate inflation portion includes a substantially constant cross-section along the length of the inflation portion, the constant cross-section being defined orthogonal to the length of the tubular elongate inflation portion.

6. The teat cup assembly of claim 1, wherein the diaphragm wall comprises an upper surface defining a spoke configuration therein configured to provide reinforcement to the diaphragm wall.

7. The teat cup assembly of claim 1, wherein the head portion and the tubular elongate inflation portion each comprise an elastomeric material.

8. The teat cup assembly of claim 1, wherein the milk receiving cup comprises a substantially transparent polymeric material.

9. The teat cup assembly of claim 1, wherein the outer surface of the tubular sleeve between the upper and lower end portions is configured to be a substantially exposed surface of the tubular sleeve.

10. The teat cup assembly of claim 1, wherein the tubular sleeve includes a vacuum port defining a porthole therein extending through the inner surface of the tubular sleeve.

11. The teat cup assembly of claim 1, wherein the interference fit of the tubular elongate inflation portion is configured to maintain the head portion to the tubular sleeve with the tension placed on the tubular elongate portion.

12. An improved teat cup assembly of the type including a tubular sleeve having an inner surface and an outer surface defining a sleeve bore between first and second open sleeve ends, the outer surface of the tubular sleeve defining an upper end portion and a lower end portion thereof, a milk receiving cup having a portion configured to be operatively coupled to

the lower end portion of the tubular sleeve, and an inflation liner with an end inverted around the lower end portion and retained there around with the portion of the milk receiving cup slid over the inverted end for retaining with an interference type fit, the improvement comprising:

a liner member including:

a head portion including an upper teat chamber defined with a cylindrical wall having an outer exposed surface, an intermediate wall extending substantially orthogonally inward from the cylindrical wall and an upper seal wall laterally extending inward from the cylindrical wall having a central opening defined by the upper seal wall, the cylindrical wall of the head portion including a cylindrical retaining extension configured to cooperate with and be coupled to the upper end portion of the tubular sleeve; and

a tubular elongate inflation portion including side walls with opposite first and second ends defining a liner bore longitudinally along a length of the tubular elongate inflation portion with opposite first and second open ends, the first end integrally interconnected and extending from the intermediate wall of the head portion with the first open end opening into the upper teat chamber, the second end of the tubular elongate inflation portion being a free end;

wherein the tubular elongate inflation portion is configured to be inserted through the sleeve bore so that the cylindrical retaining extension is disposed around the upper end portion of the tubular sleeve with the inflation portion configured to be placed in tension with the free end of the tubular elongate portion invertedly drawn around the lower end portion of the tubular sleeve with the portion of the milk receiving cup capturing the inverted free end between the lower end portion with an interference fit.

13. A liner member configured to be used in a teat cup assembly including a tubular sleeve and a milk receiving cup, the liner member comprising:

a head portion including an upper teat chamber defined with a cylindrical wall having an outer exposed surface, an intermediate wall extending substantially orthogonally inward from the cylindrical wall and an upper seal wall laterally extending inward from the cylindrical wall having a central opening defined by the upper seal wall, the cylindrical wall of the head portion including a cylindrical retaining extension configured to cooperate with and be coupled to an upper end portion of the tubular sleeve; and

a tubular elongate inflation portion including side walls with opposite first and second ends defining a liner bore longitudinally along a length of the tubular elongate inflation portion with opposite first and second open ends, the first end integrally interconnected and extending

from the intermediate wall of the head portion with the first open end opening into the upper teat chamber, the second end of the tubular elongate inflation portion being a free end;

wherein the tubular elongate inflation portion is configured to be inserted through a sleeve bore defined in the tubular sleeve so that the cylindrical retaining extension is disposed around the upper end portion of the tubular sleeve with the inflation portion configured to be placed in tension with the free end of the tubular elongate portion invertedly drawn around a lower end portion of the tubular sleeve with a portion of the milk receiving cup capturing the inverted free end between the lower end portion of the tubular sleeve with an interference fit.

14. The teat cup assembly of claim 13, wherein the side walls of the tubular elongate inflation portion comprise at least three walls extending along the length of the inflation portion.

15. The teat cup assembly of claim 14, wherein the at least three walls include curved portions defined along the length of the inflation portion, the curved portions configured to interconnect adjacent side walls.

16. The teat cup assembly of claim 15, wherein the side walls of the tubular elongate inflation portion define a first thickness and a second thickness, the second thickness larger than the first thickness, wherein the second thickness is defined at the curved portions.

17. The teat cup assembly of claim 13, wherein the tubular elongate inflation portion includes a substantially constant cross-section along the length of the inflation portion, the constant cross-section defined orthogonal to the length of the tubular elongate inflation portion.

18. A method of making a teat cup configured to draw milk from a teat of a cow in association with a vacuum pump of a milking machine providing cyclic suction thereto, the method comprising:

inserting a tubular elongate inflation liner, defining a liner bore along a length thereof, into a tubular sleeve so that an upper end portion of the tubular sleeve is disposed within a retaining portion of a head member, the head member integrally interconnected and extending to one end of the tubular elongate inflation portion so that the liner bore extends into an upper teat chamber defined in the head member;

pulling a free end of the tubular elongate inflation liner, disposed in the tubular sleeve, to place tension on the inflation liner and invertedly draw the free end around a lower end portion

of the tubular sleeve while simultaneously abutting the upper end portion of the tubular sleeve against the retaining portion of the head member with the tension placed on the tubular elongate inflation portion; and

longitudinally sliding a milk receiving cup over the inverted free end of the liner to capture the inverted free end against the lower end portion of the tubular sleeve with an interference fit.

19. The method of claim 18, further comprising maintaining the head portion abutted against the upper end portion of the tubular sleeve with the tension placed on the tubular elongate inflation portion and the interference fit of the inverted free end of the inflation portion.

20. The method of claim 18, further comprising forming the head portion and the tubular elongate inflation portion into a one-piece structure made from an elastomeric material.